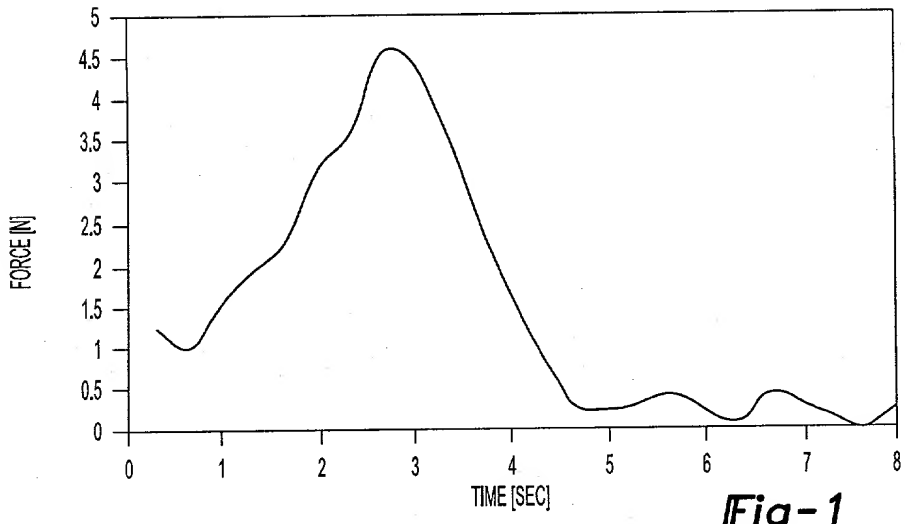


Fig-1

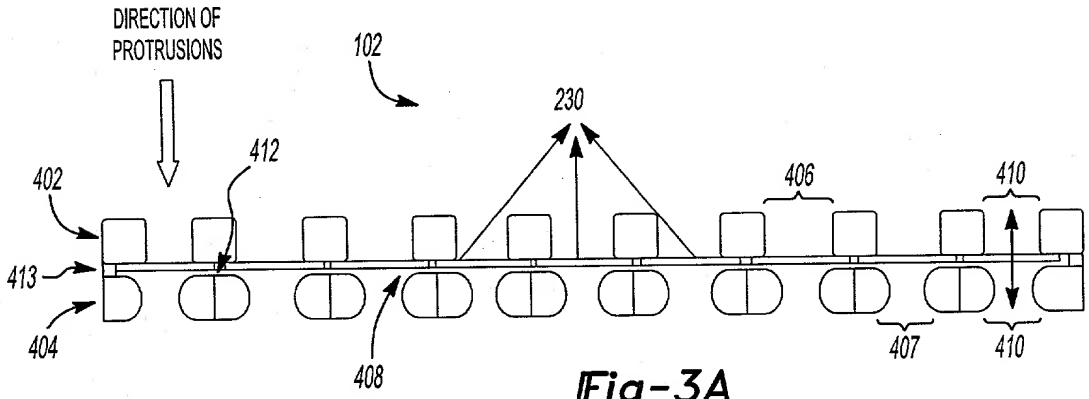
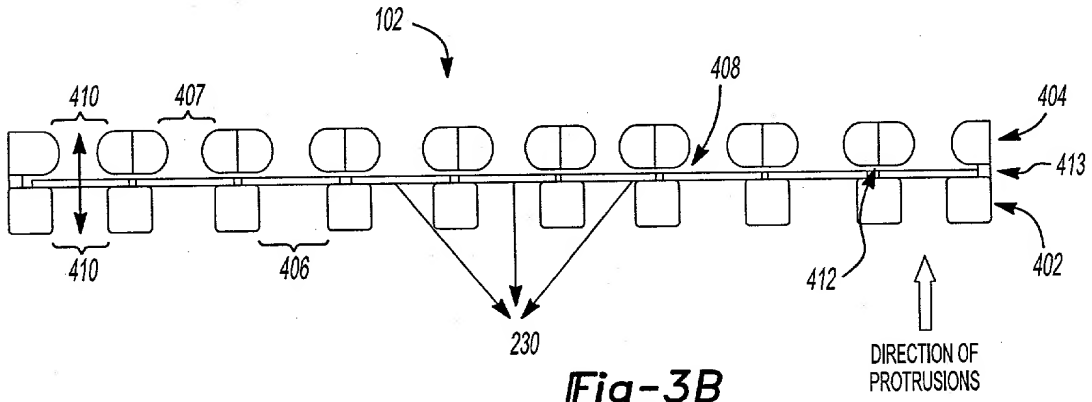


Fig-3A



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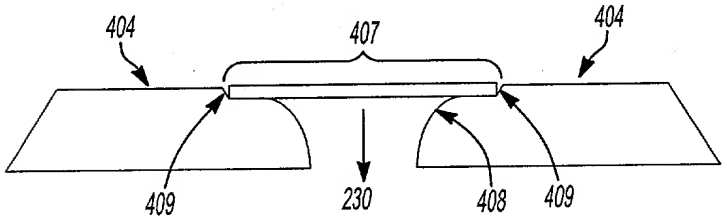

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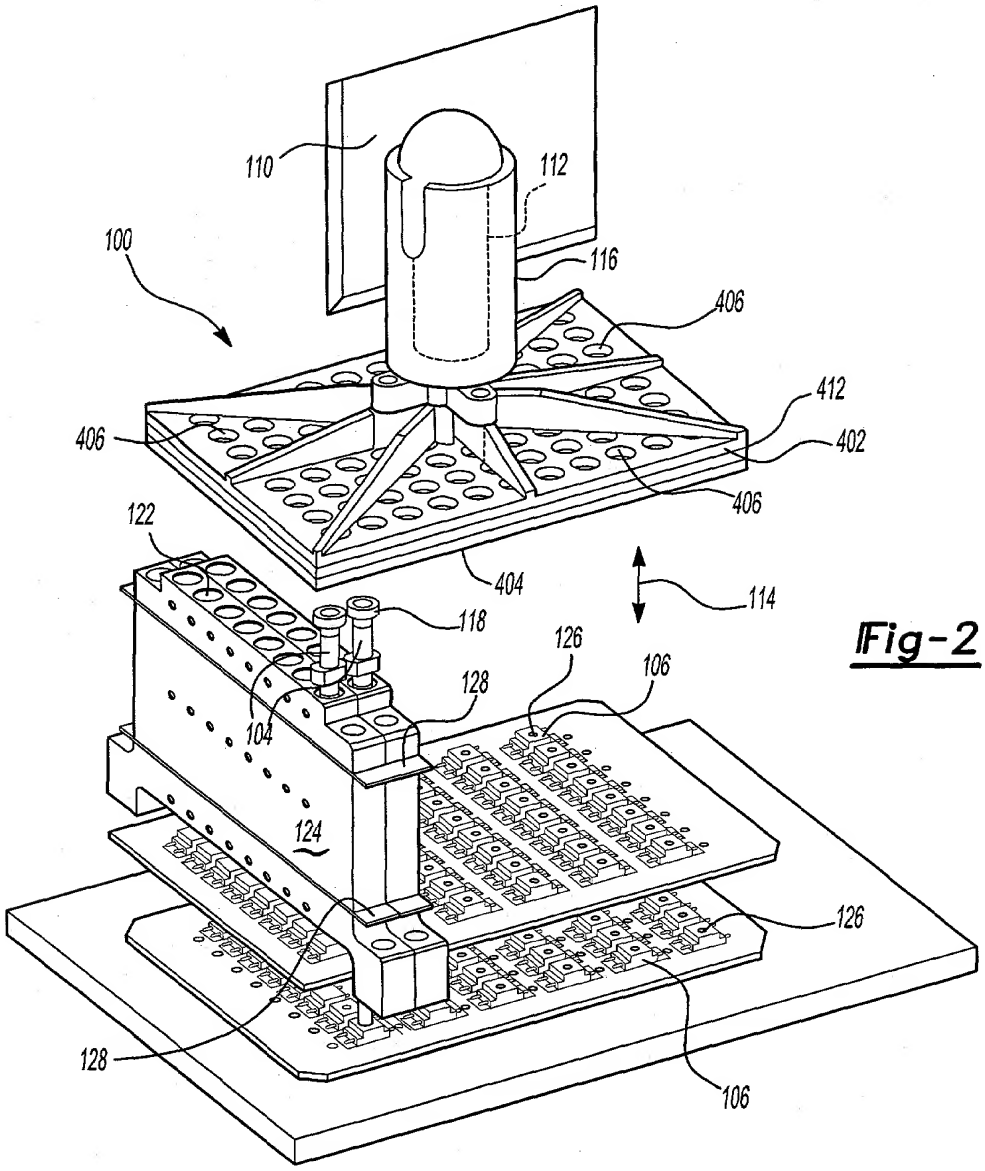
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Fig-2

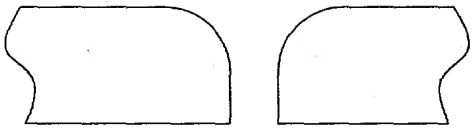
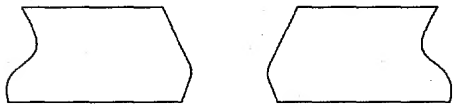


Fig-3D

Fig-3E



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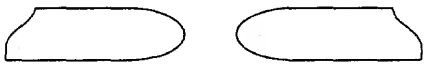

Fig-3G

Fig-3H

Fig-3I

Fig-3J

Docket: 5965-0

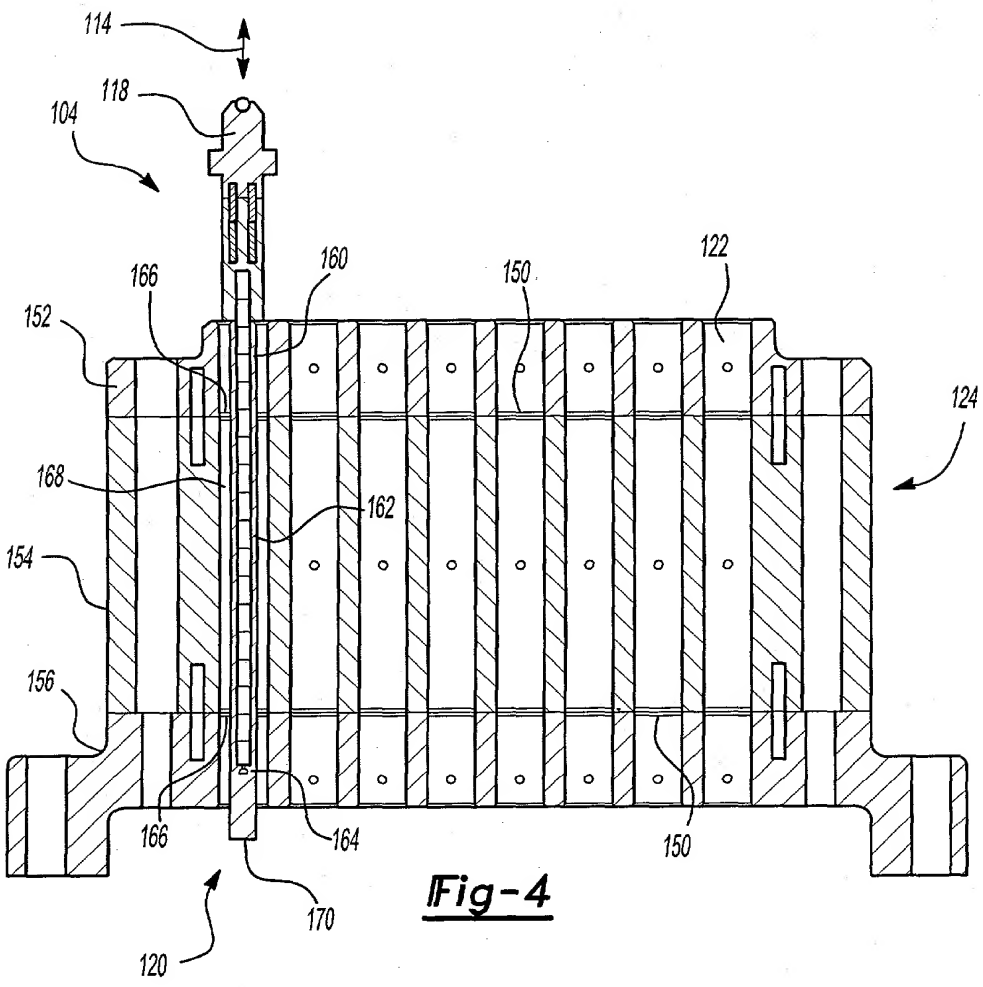
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Fig-4

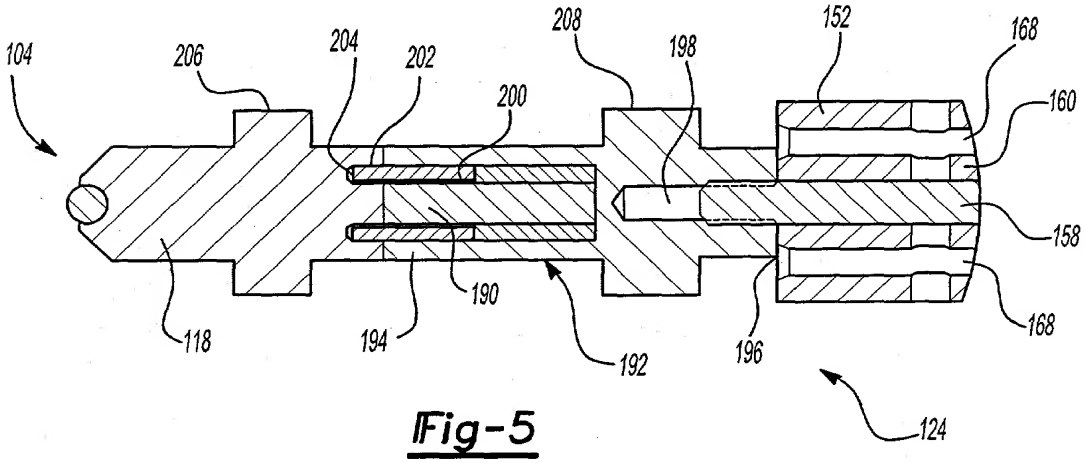
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Fig-5

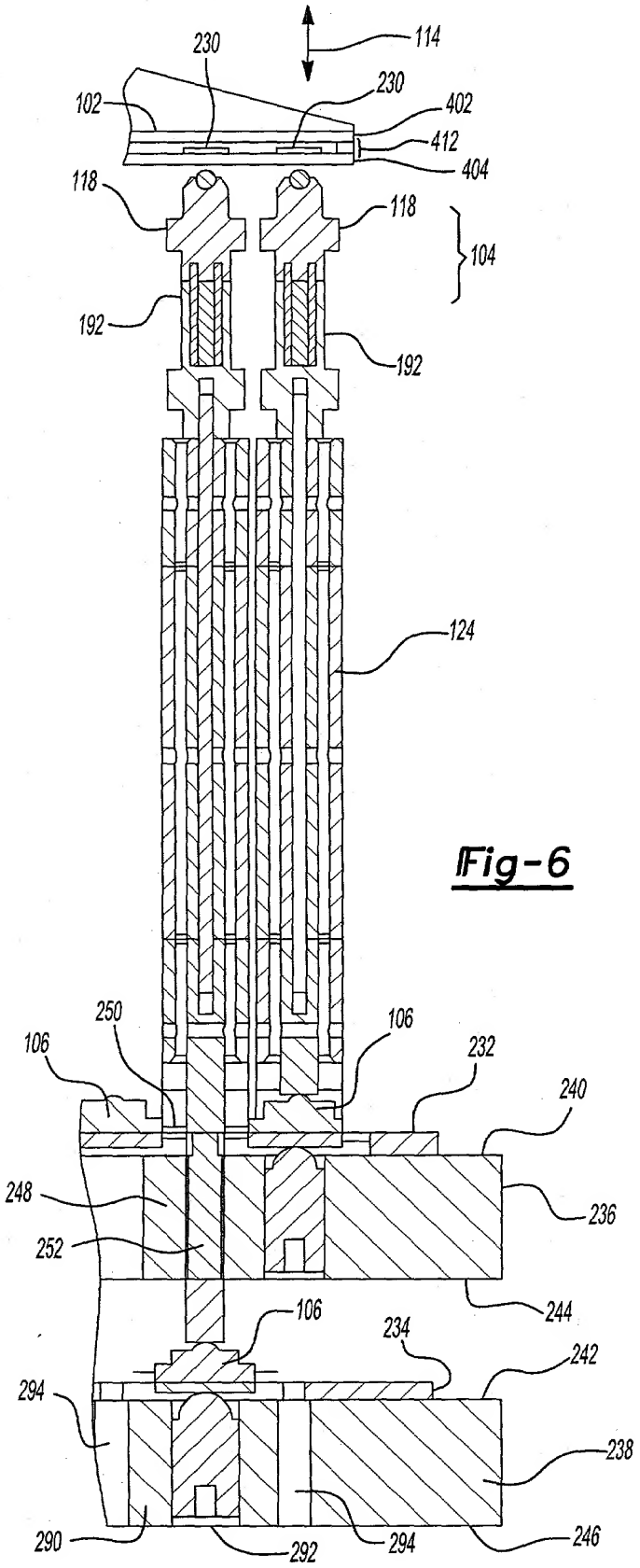
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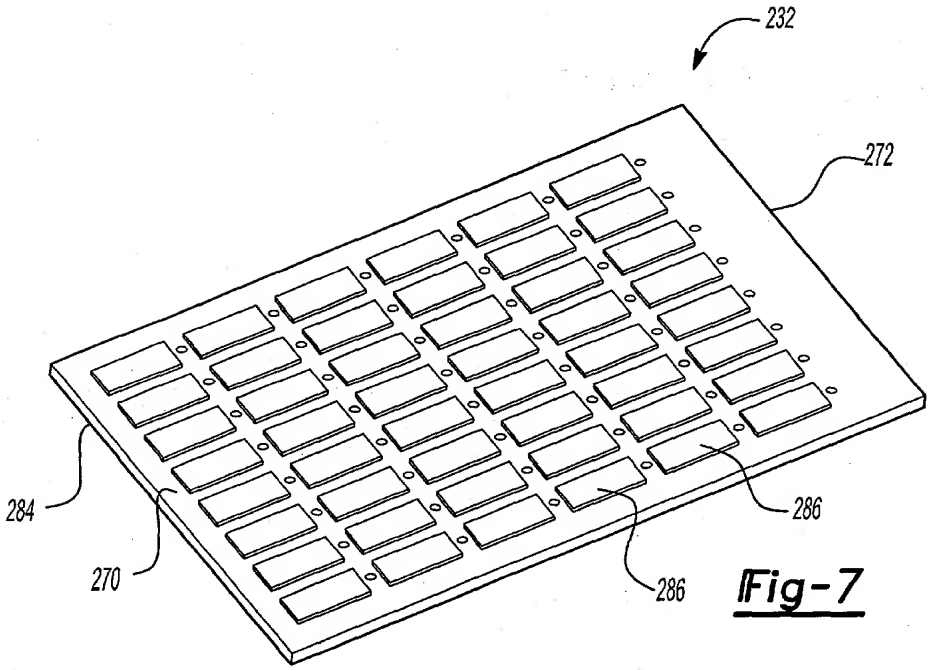
Fig-6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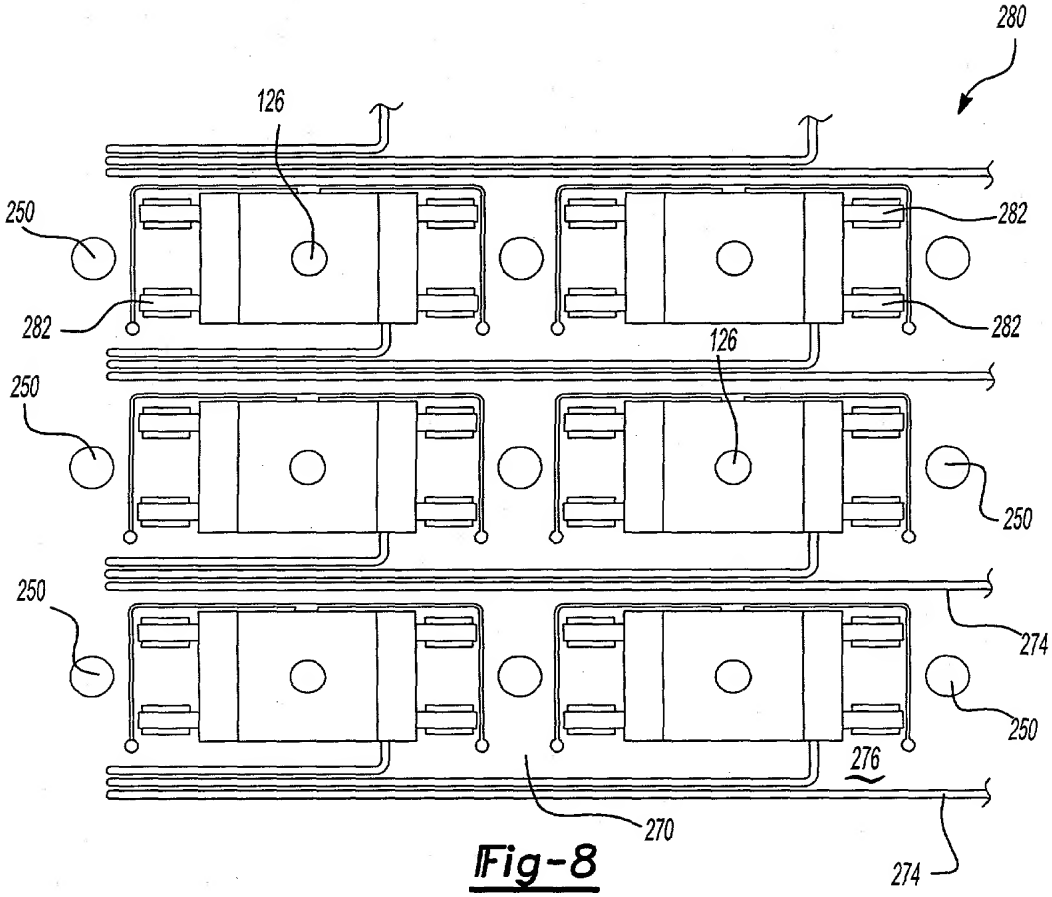
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Fig-8

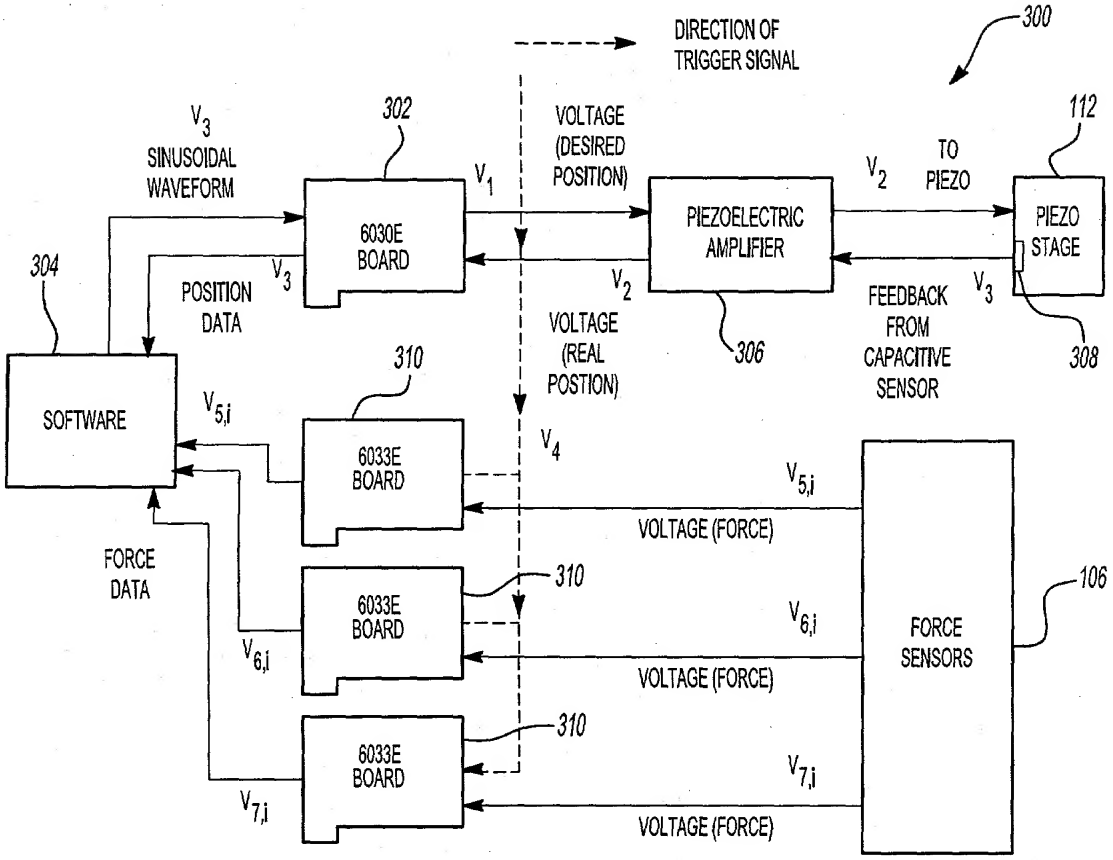
DIRECTION OF TRIGGER SIGNAL
300
V_3 SINUSOIDAL WAVEFORM
302
VOLTAGE (DESIRED POSITION)
V_1
6030E BOARD
PIEZOELECTRIC AMPLIFIER
V_2
TO PIEZO
112
PIEZO STAGE
304
POSITION DATA
V_3
V_2
VOLTAGE (REAL POSTION)
306
FEEDBACK FROM CAPACITIVE SENSOR
V_3
308
SOFTWARE
$V_{5,i}$
310
6033E BOARD
V_4
$V_{5,i}$
VOLTAGE (FORCE)
FORCE DATA
310
6033E BOARD
$V_{6,i}$
$V_{6,i}$
VOLTAGE (FORCE)
FORCE SENSORS
106
310
6033E BOARD
$V_{7,i}$
$V_{7,i}$
VOLTAGE (FORCE)

Fig-9

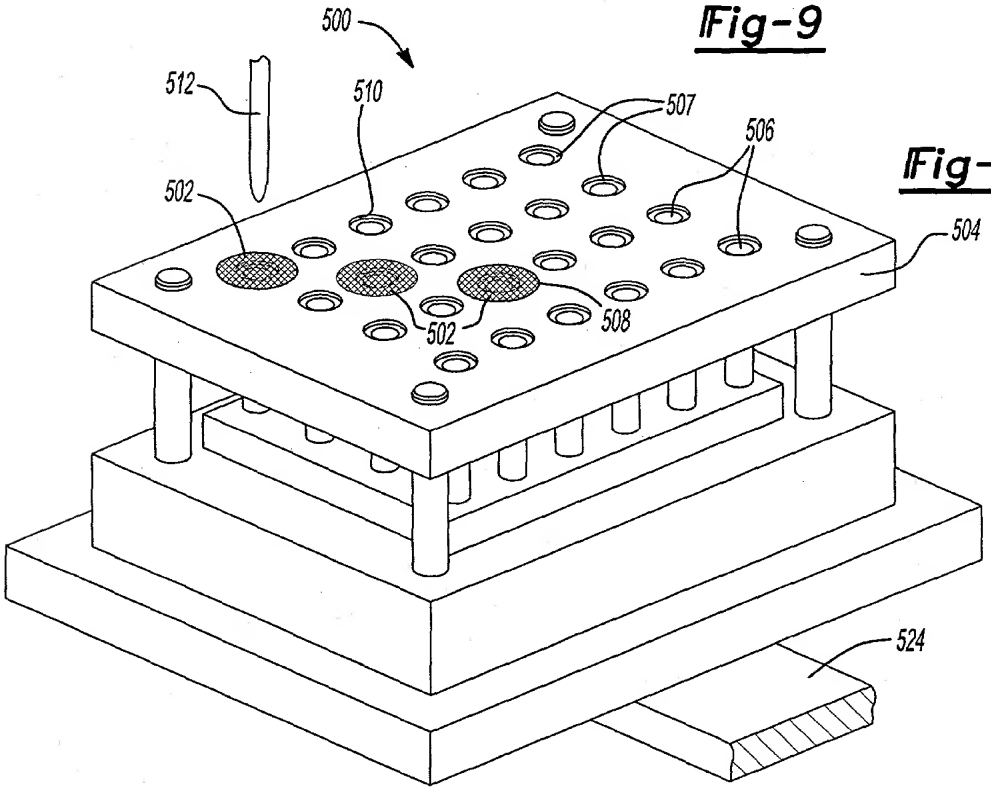
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Fig-10

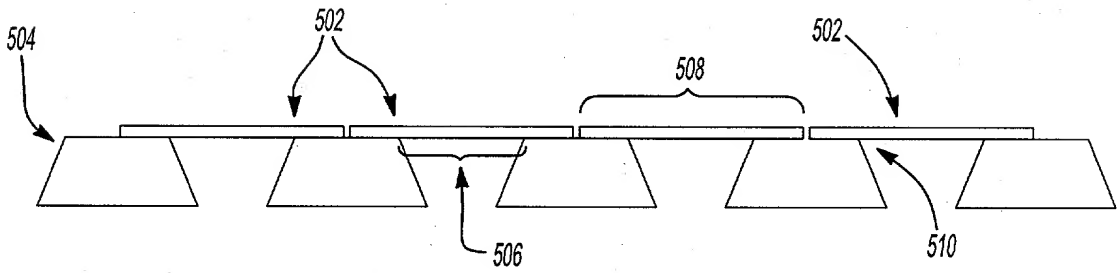
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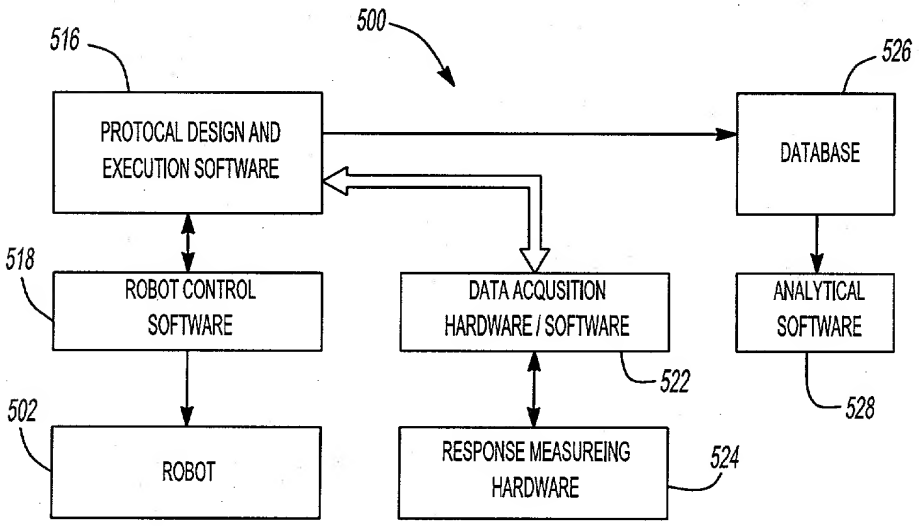
Fig-11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516
526
PROTOCAL DESIGN AND EXECUTION SOFTWARE
DATABASE
518
ROBOT CONTROL SOFTWARE
DATA ACQUSITION HARDWARE / SOFTWARE
ANALYTICAL SOFTWARE
522
528
502
ROBOT
RESPONSE MEASUREING HARDWARE
524

Fig-12